

can goods are constantly being held at foreign custom houses.

Another point which Americans are apt to neglect is the discrepancy in weights and measures between those abroad and our own. In Great Britain jewelry is measured on the arbitrary system of measurements called "forty-line scale," which means forty lines to the inch, instead of one-twelfth of an inch, which we usually understand to mean a line. A declaration was sworn to before Mr. Halstead of returned American goods, the Birmingham manufacturer having ordered from an American manufacturer a lot of "indestructible pearl," giving the measurement he required in lines. Not knowing what lines meant, the American, without inquiry, had recourse to the metric system. By this time the American manufacturer has undoubtedly received his goods, which are of a size which will render them valueless. A few weeks ago \$500 worth of fountain pens were returned to a manufacturer because they were not like the sample, although they were superior to it. From what has been already said, it will be seen that Americans, to be successful in foreign trade, must pay attention to the methods of conducting business in vogue abroad, and must particularly attend to postal matters, and must in all cases follow instructions implicitly as to measurements and shipping.

#### HOSPITAL ARRANGEMENTS IN THE SOUDAN.

It is interesting at this time of criticism and complaint to note the elaborate arrangements made by the British Army Medical Department for the final advance on Khartoum. Of course it should be remembered that the conditions which prevail in the Soudan army are much worse than anything which our medical officers have had to contend with, and in no case was the American army ever more than two or three days' sail from the base of supplies, while the British army is in the heart of Africa.

The arrangements made for the treatment of General Kitchener's army are as follows: A medical officer is attached to each infantry battalion, one also to the cavalry and to each battery of artillery. From each battalion are drawn thirty-two trained men who retain their arms and can be otherwise used in an emergency, but it is their business to give "first aid" to the injured and convey them to the field hospitals, which will be at a convenient distance behind the brigades in some sheltered position. Behind each brigade are to be five field hospitals, each with one medical officer and accommodation for twenty-five men. These five field hospitals act as one, but are made sectional in order that the sections may be adapted to follow any battalion that may act independently of the brigade. With each brigade there is also a senior medical officer. From the field hospitals the wounded are to be conveyed for treatment, as soon as possible, to barges moored off the river bank, where there will be accommodations for 200 men. These barges are to be cleaned and disinfected and fitted up as hospitals. Other barges will be used for operating purposes. Two outfits of Roentgen ray apparatus are on the barges. Additional hospital facilities will be provided on the river banks. Between Khartoum and Atbara there were to be eight lines of communication hospitals, with fifty beds, each having a medical officer attached to it. At Atbara camp ample and special accommodations have been provided, the hospital has been built of mud bricks, with walls three feet thick, and the lofty roofs protect the men from the heat. The walls are sealed with matting and thickly thatched with straw, so that this hospital is probably as cool a place as there is in the Soudan, and here there is accommodation for 250 men.

The wounded reaching this hospital are provided with hospital clothing and bedding, having sheets for their beds. Six medical officers are in charge.

There is another hospital lower down the river at Abadeah. Fifteen miles north of Berber is another mud brick hospital, with accommodations for 300, and it is to have eight medical officers. From these places and from the Atbara camp trains specially fitted up for conveying the sick and wounded will be run. At Halfa and Assuan, where there are breaks between the rail and the river, there will be severally a fifty bed and a twenty-five bed hospital for the accommodation of the men who need rest after the journey. On each of the gunboats is a medical officer. Every kind of drug and instrument that may be required is plentifully supplied, and everything is of the best quality. The organization is so thorough that there is every reason to believe that in this war there will be no mismanagement whatever in the medical treatment of the British troops. There is a force of 20 medical officers, 149 non-commissioned officers and men, and 11 women nurses to take care of 500 patients. By successive lessons of experience the authorities have been schooled into forethought and attention to medical and sanitary details with results that are highly creditable to them.

In modern warfare with weapons of such great precision and long range the number of wounded is so enormous that it is beyond the means of the existing medical service of any army to deal with them at once, if the service is not largely increased, as in the present

case. The surgeon of to-day, with all the modern appliances for the relief of the injured men, can do far more for the wounded than his predecessors in other wars could do, but this can be accomplished only by a radical increase in the number of surgeons who are sent with the army.

#### THE AMERICAN INSTITUTE PHOTOGRAPHIC, HORTICULTURAL, AND AGRICULTURAL EXHIBITION.

This exhibition opened on September 26, at the Academy of Design, this city, corner of Fourth Avenue and Twenty-third Street, and closes on October 8.

The photographic portion was got together by the secretary of the photographic section, J. W. Bartlett, M.D., and is a well arranged and interesting exhibit, comprising as it does beautiful prize genre photographs and novel effects in portraiture. The exhibit is confined to the north and east galleries and the corridor.

One exhibitor, Johannes Meyer, M.D., shows specimens of printing on silk and other fabrics by an improved process, and the Nepera Chemical Company in a special booth exhibits its quick printing process by gas light on what is called "Velox" paper. An exposure is made in the printing frame to a kerosene round flame light, about 6 inches distant, for 15 seconds, then the exposed sheet is removed from the frame at a short distance from this same light, placed in a developer and developed out by the aid of this light without damage in a very few minutes, giving an image of a rich black color or other color, as may be desired. The exhibition is more diversified and up to date than any the Institute has ever had, and is very instructive in showing the picturesque effects now obtainable by photographic apparatus and materials. About thirty-seven prizes were awarded by the judges—Charles I. Berg, William M. Murray, W. M. Hollinger, J. Carroll Beckwith, N.A., A. T. Bricher, A.N.A., and Edward Bierstadt.

The display of dahlias of all varieties and hues in the east room is very attractive. The west room is devoted to fruit and vegetable products, the center table holding examples of fruits exclusively, four-fifths of which is taken up in an exhibition of many varieties of grapes, including a few bunches of hothouse grapes of mammoth size. The south room contains large sized flowering plants of numerous kinds, and the corridor stairs, as one enters the gallery, is lined with exquisite delicate leaved ferns of many varieties. On the entrance floor were to be found several full sized models of garden implements, planters, plows, etc.

Altogether, the exhibition is unique in its way, combining as it does photography, flowers, and agriculture under one roof.

#### THE UNIFORM OF THE SOLDIER.

The returning regiments, clad in all kinds of costumes, have aroused considerable curiosity on the subject of uniforms in general. It is said that the Emperor Valerius Maximus ordered the Roman soldiers to wear red, so they would not be frightened at the sight of their own blood, and even now red forms a conspicuous part of the uniforms among the French and British forces. Red has been ruled out of our own army of recent years, except for facings, largely upon the theory that the color was too conspicuous to carry into the field. This is not, however, strictly true, if we rely upon experiments made by the European military experts. German rifle range practice has shown that a blue target is hit three times while a red target is hit once. Other interesting tests have been made with a view to determining the distance that soldiers are visible; and out of a squad of ten soldiers clad in gray, scarlet, dark blue, and green, dark gray was the color that remained longest in view; next came the dark blue with the dark gray, while scarlet was the second to disappear, being excelled only by the dark gray.

The evolution of the uniform is the subject of an interesting article in The New York Evening Post, from which we glean the following facts: When the Revolutionary war broke out, each colony had its militia, and the uniforms of no two bodies were alike. At Lexington and Concord it does not appear that the patriots had any uniforms. The same is true of Bunker Hill, but soon after the latter battle, some general rules for a military costume were adopted. The higher officers came to be known by the colors of the fibbons worn across their breasts. The officers lower in rank were distinguished by the cockades worn in their hats. Throughout the war there was no special system of uniform in force for the rank and file of the patriotic army, for obvious reasons; the colonists were poor, and the war made it impossible to import material for clothing from England. Homespun did not lend itself readily to great variations of color, and even after it had been decided to make blue the standard color of the American uniform, the local jealousies existing between the colonists required the use of different colors for facings. In 1802 a uniform was prescribed for our army consisting of a dark blue coat reaching to the knee, scarlet lapels and cuffs, white waistcoat and cross belt, and dark blue pantaloons for the winter

and white for the summer. These articles of clothing were exchanged later for single-breasted coats without facings, and during the whole period the height of the collar kept rising, ending with the requirement that it should be worn high enough to reach the tip of the ear, and in front as high as the chin would permit in turning the head. It was in this costume, including a high silk hat, that our ancestors fought the British in the war of 1812. In 1821 dark blue was declared to be the national uniform color for both officers and enlisted men, the only exception being scarlet coats for musicians and gray coats for cadets. Various changes took place in the shape of the clothing of the soldiers until 1863, when our uniforms became practically fixed, the cloth for the trousers being light blue and the facings being light blue for infantry, yellow for cavalry, and red for artillery.

For general campaigning, the old Continental uniform, which was largely used during the Revolutionary days, is the most satisfactory. The British came to associate with this costume the idea of the skilled hunter and marksman, as found in our soldiers of that day, and they dreaded nothing more than coming upon a large body of colonists clad in this garb.

With the refinements of the uniform came a series of changes in the fashion of wearing the hair and beard. In the days of the Revolution, the troops, when on dress parade, wore their hair queued and powdered, and they themselves were clean shaven. One of Washington's orders was that at general inspection and reviews two pounds of flour and one and one-half pounds of rendered tallow for a hundred men should be used in dressing the hair, and another reminded the men that they would "not be allowed to appear with their hair down their backs and over their foreheads and down their chins at the side, which makes them appear more like wild beasts than soldiers," and that "any soldier who comes on the parade with beard or hair unkempt shall be dry shaved immediately and have his hair dressed on parade." It was not until a half century later that the order regarding whiskers was rescinded, the only rule since then being that they be kept short and neatly trimmed.

#### SAVING THE "MARIA TERESA."

The successful floating of the "Maria Teresa" has revived speculation in regard to the possibility of floating the "Colon." It is understood now that the government will afford Lieut. Hobson every facility for carrying forward this task. The difficulties in the way of raising the "Colon" are well understood, and any one examining the view of the "Colon" published in the SCIENTIFIC AMERICAN of July 30, as she lies on her side battered by the breakers, will appreciate the serious obstacles to be overcome.

The "Teresa" was blown off the rocks into deep water by dynamite on September 23, and proceeded to Guantanamo Bay accompanied by a wrecking tug, and she will shortly leave for a Northern navy yard, where she will be docked. Lieut. Hobson had charge of the raising of the "Teresa." His scheme for floating the "Colon" is most elaborate, and involves the use of air bags and dynamite. He has also suggested to the department the advisability of pulling the "Colon" around so that she will lie parallel to the shore instead of stem on. Reports received from Santiago show that the "Reina Mercedes" can be raised without any great trouble. She is sunk just at the mouth of Santiago Harbor, in a position well protected from storms, and when the work on the "Colon" is ended the wreckers will turn their attention to her. The "Mercedes" is a protected cruiser of 3,090 tons, and was built eleven years ago. The authorities consider her well worth saving. It is a curious fact that the Spanish officers of the "Mercedes" considered that, after the destruction of Cervera's fleet, the Americans would be caught napping, and that the "Mercedes" would have no trouble in forcing the blockade. The "Maria Teresa" will certainly form a great object of interest when she is refitted and when she appears flying the stars and stripes.

#### "SLATE WRITING AND KINDRED PHENOMENA."

It gives us great pleasure to announce that we commence in this number the publication of a series of articles under the heading given above. They are from the pen of Mr. W. E. Robinson, who is a well known authority on magic art, as he has been identified with it for the past twenty-five years. The articles are of particular value, as in his youth Mr. Robinson was brought up in the spiritualistic belief, but when he commenced to dabble in magic and understood the clever tricks of the prestidigitateur, the phenomena he often witnessed at séances became mere delusions and shams. He has made it a life study to deal with the methods employed by mediums to dupe their victims. Mr. Robinson has devised some of the cleverest stage illusions ever produced, and for many years was the assistant of the late Herrmann. He was also connected with the celebrated magician Kellar and is now stage machinist of the present Herrmann company. The articles will be profusely illustrated.